I claim:

1. A method for calculating shading correction coefficients for an imaging system, comprising the steps of:

   i. defining a set of calibration regions on a calibration standard;

   ii. defining a first part and a second part of said calibration standard, wherein each of said first and second parts contains at least one calibration region;

   iii. taking an image of said calibration standard and calculating an initial image intensity for each of said calibration regions, thereby providing a set of initial image intensities;

   iv. re-arranging said first and second parts to form a re-arrangement of said calibration standard;

   v. taking an image of said re-arrangement and calculating a re-arranged image intensity for each of said calibration regions, thereby providing a set of re-arranged image intensities;

   vi. calculating a shading error for each of said calibration regions; and

   vii. calculating a shading correction coefficient for each of said calibration regions.

2. The method of claim 1 wherein step (vi) is performed by:

   (a) defining a relationship between the set of initial image intensities and the set of re-arranged image intensities, wherein said relationship defines a relative shading error for each of said calibrations regions;

   (b) specifying a preliminary shading error for a selected number of said calibration regions; and

   (c) using said relationship to determined the relative shading error for the remaining calibration regions.

3. The method of claim 2 wherein the selected number is equal to the number of calibration regions in the second part.

4. The method of claim 2 wherein the second part contains one calibration regions and wherein said selected number is one.

5. The method of claim 1 wherein step (vi) includes normalizing the shading errors for all of said calibration regions, so that the average of said shading errors equals a selected value.

6. The method of claim 5 wherein the selected value is one.

7. The method of claim 1 wherein step (vii) includes normalizing the shading correction coefficients for all of said calibration regions, so that the average of said shading correction coefficients equals a selected value.

8. The method of claim 7 wherein the selected value is one.

9. The method of claim 1 wherein step (iv) is performed by physically detaching said calibration standard to separate said first and second parts and then reattaching the first and second parts to form said re-arrangement and wherein, in step (v), the re-arrangement is positioned in said imaging system in a position corresponding to the position of the calibration standard in step (iii).

10. The method of claim 9 wherein, in step (v), the re-arrangement is positioned in said imaging system so that said calibration regions of said re-arrangement are aligned with the positions of the calibration regions of the calibration standard in step (iii).

11. The method of claim 1 wherein each of said calibration regions includes material having one or more characteristics corresponding to an object to be imaged using said imaging system.

12. The method of claim 1 wherein the calibration standard is shaped to correspond to the field of view of the imaging system.

13. The method of claim 1 wherein the calibration standard is shaped to correspond to a portion of the field of view of the imaging system.

14. The method claim 1 wherein the calibration standard is shaped to correspond to shape of an object to be imaged using the imaging system.

15. The method of claim 1 wherein said calibration regions are spaced apart.

16. The method of claim 1 wherein said calibrations regions are spaced at regular intervals.

17. The method of claim 1 wherein said calibrations regions are not spaced apart.

18. The method of claim 1 wherein, in step (iii), said calibration standard is imaged in an initial position, and wherein steps (iv) and (v) are accomplished by:

(a) shifting said calibration standard in a first direction by a distance corresponding to said first part and then taking a first shifted image of said calibration standard and returning said calibration standard to its initial position;

(b) shifting said calibration standard in a second direction by a distance corresponding to said second part and then taking a second shifted image of said calibration standard;

(c) combining portions of said first and second shifted images to form said re-arrangement of said calibration standard.

19. The method of claim 1 wherein said first part includes only one calibration region.

20. The method of claim 1 wherein steps (i) to (vii) are first performed in respect of a first calibration standard to obtain a first shading correction coefficient for each of said calibration regions and wherein steps (i) to (vii) are repeated in respect of a second calibration standard to obtain a second shading correction coefficient for each of said calibration regions and wherein, for each said calibration regions, said first and second correction coefficients for each said calibration region are combined to provide a final shading correction co-efficient.

21. The method of claim 20 wherein said first and second shading correction coefficients are combined by averaging them.

22. The method of claim 20 wherein said first and second shading correction coefficients are combined by taking a weighted average between them.

23. The method of claim 22 wherein the weighting of the weighted average is based on the error mean of the first and second shading correction coefficients.

24. The method of claim 22 wherein the weighting of the weighted average is based on the error mean and the error standard deviation of the first and second shading correction coefficients.

25. A method for calculating shading correction coefficients for an imaging system, comprising the steps of:

i. defining a set of calibration regions on a calibration standard;

ii. defining a first part, a second part, a third part and a fourth part of said calibration standard, wherein each of said first, second, third and fourth parts contains at least one calibration region;

iii. taking an image of said calibration standard and calculating an initial image intensity for each of said calibration regions;

iv. re-arranging said first, second, third and fourth parts in a first direction to form a first re-arrangement of said calibration standard;

v. taking an image of said first re-arrangement and calculating a first re-arranged image intensity for each of said calibration regions;

vi. re-arranging said first, second, third and fourth parts in a second direction to form a second re-arrangement of said calibration standard;

vii. taking an image of said second re-arrangement and calculating a second re-arranged image intensity for each of said calibration regions;

viii. calculating a shading error for each of said calibration regions; and

ix. calculating a shading correction coefficient for each of said calibration regions.

26. The method of claim 25 wherein step (viii) is performed by:

(a) defining a relationship between the set of initial image intensities and the set of re-arranged image intensities, wherein said relationship defines a relative shading error for each of said calibrations regions;

(b) specifying a preliminary shading error for a selected number of said calibration regions; and

(c) using said relationship to determined the relative shading error for the remaining calibration regions.

27. The method of claim 26 wherein the selected number is equal to the number of calibration regions in the fourth part.

28. The method of claim 26 wherein the fourth part contains one calibration regions and wherein said selected number is one.

29. The method of claim 25 wherein step (viii) includes normalizing the shading errors for all of said calibration regions, so that the average of said shading errors equals a selected value.

30. The method of claim 29 wherein the selected value is one.

31. The method of claim 25 wherein step (ix) includes normalizing the shading correction coefficients for all of said calibration regions, so that the average of said shading correction coefficients equals a selected value.

32. The method of claim 31 wherein the selected value is one.

33. The method of claim 25 wherein step (iv) is performed by physically detaching said calibration standard to separate said first and second parts from said third and fourth parts and then reattaching the first and second parts to said third and fourth parts to form said first re-arrangement and wherein, in step (v), the first re-arrangement is positioned in said imaging system in a position corresponding to the position of the calibration standard in step (iii).

34. The method of claim 33 wherein, in step (v), the first re-arrangement is positioned in said imaging system so that said calibration regions of said first re-arrangement are aligned with the positions of the calibration regions of the calibration standard in step (iii).

35. The method of claim 25 wherein step (vi) is performed by physically detaching said calibration standard to separate said first and third parts from said second and fourth parts and then reattaching the first and third parts to said second and fourth parts to form said second re-arrangement and wherein, in step (vii), the second re-arrangement is positioned in said imaging system in a position corresponding to the position of the calibration standard in step (iii).

36. The method of claim 35 wherein, in step (v), the second re-arrangement is positioned in said imaging system so that said calibration regions of said second re-arrangement are aligned with the positions of the calibration regions of the calibration standard in step (iii).

37. The method of claim 25 wherein each of said calibration regions includes material having one or more characteristics corresponding to an object to be imaged using said imaging system.

38. The method of claim 25 wherein the calibration standard is shaped to correspond to the field of view of the imaging system.

39. The method of claim 1 wherein the calibration standard is shaped to correspond to a portion of the field of view of the imaging system.

40. The method claim 25 wherein the calibration standard is shaped to correspond to shape of an object to be imaged using the imaging system.

41. The method of claim 25 wherein said calibration regions are spaced apart.

42. The method of claim 25 wherein said calibrations regions are spaced at regular horizontal intervals and at regular vertical intervals.

43. The method of claim 42 wherein said horizontal intervals are equal to said vertical intervals.

44. The method of claim 25 wherein said calibrations regions are not spaced apart.

45. The method of claim 25 wherein, in step (iii) said calibration standard is imaged in an initial position, and wherein steps (iv) and (v) are accomplished by:

(a) shifting said calibration standard in a first direction by distance corresponding to said first part and then taking a first shifted image of said calibration standard and returning said calibration standard to its initial position;

(b) shifting said calibration standard in a second direction by a distance corresponding to said second part and then taking a second shifted image of said calibration standard and returning said calibration standard to its initial position;

(c) combining portions of said first and second shifted images to form said first re-arrangement of said calibration standard.

and wherein calibration steps (vi) and (vii) are accomplished by:

(d) shifting said calibration standard in a third direction by distance corresponding to said first part and then taking a third shifted image of

said calibration standard and returning said calibration standard to its initial position;

(e) shifting said calibration standard in a fourth direction by a distance corresponding to said third part and then taking a fourth shifted image of said calibration standard and returning said calibration standard to its initial position;

(f) combining portions of said third and fourth shifted images to form said second re-arrangement of said calibration standard.

46. The method of claim 25 wherein said first part includes only one calibration region.

47. The method of claim 25 wherein said first part includes a rectangular array of calibration regions and wherein said second part includes an array of calibration regions adjacent to one side of said calibration standard and wherein said third part includes an array of calibration regions adjacent to a second side of said calibration standard and wherein said fourth part includes at least one calibration regions adjacent said second and third parts.

48. The method of claim 1 wherein steps (i) to (vii) are first performed in respect of a first calibration standard to obtain a first shading correction coefficient for each of said calibration regions and wherein steps (i) to (vii) are repeated in respect of a second calibration standard to obtain a second shading correction coefficient for each of said calibration regions and wherein, for each said calibration regions, said first and second correction coefficients for each said calibration region are combined to provide a final shading correction co-efficient.

49. The method of claim 48 wherein said first and second shading correction coefficients are combined by averaging them.

50. The method of claim 48 wherein said first and second shading correction coefficients are combined by taking a weighted average between them.

51. The method of claim 50 wherein the weighting of the weighted average is based on the error mean of the first and second shading correction coefficients.

52. The method of claim 50 wherein the weighting of the weighted average is based on the error mean and the error standard deviation of the first and second shading correction coefficients.